DP-300566

IN THE SPECIFICATION

Please substitute the following paragraph for the paragraph beginning at line 13 of page 5 and ending at line 5 of page 6.

A formulation for producing a conductive co-fired body, for example for tape 1 above, comprises, based upon the total weight of the co-fired body, up to about 95 mole% zirconia (ZrO_2), with about 85 to about 93 mole% preferred; up to about 10 mole% yttrium oxide (Y_2O_3), with about 3 to about 7 mole% preferred; and up to about 10 mole% alumina (Al_2O_3), with about 3 to about 7 mole% preferred; wherein after processing and firing, about 1 weight% to about 45 weight% of the ~~co-fired body~~ zirconia is monoclinic phase zirconia, with about 15 weight% to about 30 weight% preferred, and about 18 weight% to about 25 weight% especially preferred, ~~with the~~ balance ~~of zirconia present in the co-fired body being~~ cubic and tetragonal phases. Preferably, a sufficient amount of the zirconia is in the monoclinic phase such that the sintering curve of the zirconia body tape and the alumina body tape (measured individually via a sintering dilatometer method), have a sintering mismatch of about 5% or less. The yttrium oxide added here acts as a stabilizer. The zirconium oxide is generally purer than that used in prior art formulations, e.g., the zirconia comprises less than about 100 parts per million (ppm) of each of silica, sodium, calcium, magnesium, iron, titanium, chlorine, and other impurities, with a total impurity amount of less than about 1,000 ppm more preferred, and a total of less than about 500 ppm more preferred, and a total of less than about 300 ppm especially preferred. By having minimal impurity levels, especially silicon (Si), in the zirconia body batch ingredients, the effects of diffusion of impurity species to the electrode/electrolyte interface are minimized. This helps attain low overall cell impedance; for example, an electrode resistivity about 10 ohm-cm or lower at 800°C in air, and a total cell bulk DC resistivity about 250 ohm-cm or lower at 800°C in air.

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Please substitute the following paragraph for the paragraph beginning at page 11, line 17 and ending at line 28.

The disclosed invention provides several improvements. First, ~~up~~ about 1 weight% to about 45 weight%, preferably about 15 weight% to about 30 weight%, of the zirconia ~~body~~ after firing is in a monoclinic phase, wherein fully stabilized or tetragonal zirconia bodies have no monoclinic phase detectable by x-ray diffraction. This enables co-firing with a high alumina body which thereby enables production of co-fired, monolithic, hybridized zirconia/alumina body structures. Second, the cell after firing has low electrode impedance (e.g. below about 10 ohm-cm) and total bulk DC resistivity (e.g., below about 250 ohm-cm). This shortens the time to activity, reduces power consumption, and enables enhanced sensor performance (for example, enhanced range and/or sensitivity). Also, the low impedance cell has an improved stability and performance due to the purer materials utilized.